

## Issues Tracking Table - Tulsequah Chief Barge Transportation System – Project Certificate Amendment Application

ISSUE NUMBER	AUTHOR OF COMMENT	ISSUE RAISED BY GOVERNMENT	REDFERN RESPONSE	APPLICABLE REGULATORY PROCESS
1	Fisheries and Oceans (1)	Application should include information required under CEAA.	The CEAA scope has yet to be confirmed by DFO.	CEAA Screening
2	Fisheries and Oceans (1)	There is an absence of current and traditional activities being practiced by First Nations.	TRTFN is undertaking a Traditional Land Use Impact Study that will identify current and historic use of the area. Current activities are focussed on the commercial fishery and subsistence fishery. (See Issue #3 below.)	BCEA Amendment CEAA Screening
3	Fisheries and Oceans (1)	There is an absence of consultation and support of commercial fishers.	Commercial fishermen were interviewed on the river in July 2007 to identify concerns related to project. These concerns are summarized in Section 2.1.2, <i>First Nation Issues and Concerns</i> , Vol. 2. Records of these interviews can be provided if requested	CEAA screening BCEA Amendment
4	Fisheries and Oceans (1)	There is an absence of a cumulative effects assessment that considers the implications of the fishery as it relates to downstream habitat impacts within the State of Alaska.	Cumulative effects are addressed in Section 4.10, <i>Cumulative Effects</i> , Vol. 2. Potential developments in the area include the Big Bull and Polaris exploration properties. At this time, however, there are no known plans to develop these properties within the 10-year mine life of Tulsequah Chief. As such, there are no known developments that overlap spatially and temporally with the proposed ACB transportation system. The CEAA requirement has been addressed.	CEAA screening
5	Fisheries and Oceans (1)	Conclusions for significant adverse effects are provided in the absence of detailed site information or modeling which supports prediction of effects.	The significance determination is based on the circumstance under which the effect would occur and the area of fish habitat potentially affected. . The potential entrainment of juvenile fish into the air wash of the ACB would only occur in shallow waters (less than 2 feet or 0.6m) when the barge is entering or leaving the water. In Canada, this may occur at the barge landing site. Other important fish habitats, such as clear water channels, will be avoided during the aquatic season. The barge landing area at Big Bull Slough will be monitored when operations begin to confirm the predicted effects and to modify operations if necessary to limit effects to juvenile fish.  In relation to the total length of riverbank along the barge route, the potential area affected represents a very small amount of the total habitat where juveniles are found. , The time spent passing these areas will be relatively short. Manufacturer advice indicates that the wake is likely to be small and therefore the potential beaching of juveniles along the route is minimal. Tests will be undertaken to confirm wake heights prior to operations starting. Therefore the potential effect was considered to be minimal.	CEAA screening BCEA Amendment
6	Fisheries and Oceans (1)	The proposed mitigation cites monitoring as a measure to identify impacts post operation, rather than pre-project assessment and development of adaptive management measures and thresholds to avoid, monitor and measure potential impacts.	The purpose of the proposed monitoring is to provide additional site-specific information that can then be used to adjust operations, if the monitoring results so indicate. The results of monitoring will be used to develop and/or adjust operating procedures and management plans, where warranted. Redfern is developing more details around the field tests that will be carried out during the commissioning phase, and monitoring during ongoing operations. Much of this material will be relevant to both the Canadian and Alaskan portions of the river and will be circulated when it is available. .	CEAA screening BCEA Amendment
7	Fisheries and Oceans (1)	There is an absence of a Fish Habitat Mitigation and Compensation Plan.	In the absence of a HADD determination, site specific Habitat Mitigation and Compensation Plan is premature. Appendix A, <i>Environmental Management Plan Outline</i> , Vol. 2 provides a basic outline of the	CEAA screening Fisheries Act Authorization

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			measures that will be developed to minimize project effects, such as management of large woody debris in the navigational channel. The environmental assessment identified one harmful alteration, disruption or destruction of fish habitat. This potential HADD is associated with the riparian habitat at the barge landing site that will have to be removed and the infilling of a section of a backwater channel that is wetted during high water conditions (see Table 4-3, <i>Context for Assessment: Biological Impacts</i> , and Section 3.3.2, <i>Aquatic Resources Associated with Haul Road to ACB Landing Site</i> ). A total area affected is estimated to be 1,000 m <sup>2</sup> and proposed compensation would be reconstruction of a backwater channel in the vicinity of the barge landing area, or at an alternate location if this is not suitable or practical.	
8	Fisheries and Oceans (1)	Recommend identification of all potential triggers requiring Fisheries Act authorization along the proposed navigational route, including those trigger locations within the entire project area previously identified in past environmental assessments for the Tulsequah Chief Mine project (see Section 1.2)	Based on our assessment the only trigger for a Fisheries Act authorization for the barge operation that would require a CEAA screening is related to the habitat alteration at the barge landing area as described above.	Fisheries Act Authorization CEAA screening
9	Fisheries and Oceans (1)	Recommend clarification of draught of air cushion barge when at maximum storage capacity (see Section 3.1)	The draught of ACB is at fully loaded capacity (450 tonnes) as described in Volume 1, page 13. When fully loaded, on full hover, the skirt and its associated air chamber will displace approximately 1240m <sup>3</sup> water, and have a maximum draught of 2.5 feet or 0.75 m. It is important to stress that this draught is the depth of the flexible skirt and or the air under the ACB.	N/A
10	Fisheries and Oceans (1)	Recommend predicted reduction in noise generation be clarified with monitoring of air cushion barge noise proposed to validate assumptions (Section 3.1)	The engines and fans on the ACB and amphitrac will be enclosed, so the noise will be muffled. A comparison of noise levels with other familiar craft is provided for context. No specific measures were identified to reduce noise, other than the enclosure of the engines and fans. Information on the expected underwater noise created by hovercraft is presented in Section 4.4.2.5, <i>Aquatic Noise</i> , Vol. 2 Above surface and underwater noise levels associated with the ACB will be recorded during the commissioning phase in February/March 2008.	CEAA screening
11	Fisheries and Oceans (1)	Recommend information obtained during 2007 barge activities be provided which identify flow conditions and operational difficulties encountered (see Section 4.3).	Summary of 2007 barge activities attached.	N/A
12	Fisheries and Oceans (1)	Recommend the proponent conduct hydrologic assessment of the Taku River at the Tulsequah River confluence and at the Big Bull Slough near the Barge landing location (see Section 3.2).	This comment does not clearly define the purpose, scope, and objectives for such a study. A supplementary memo is being prepared, including maps that show the bathymetry of the Taku River from the US/Canada border to the confluence with the Tulsequah River. Bathymetric data for the Big Bull Slough landing area will have to wait until the river thaws.	CEAA screening

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			Real-time, continuous hydrometric data is currently being collected on the Taku River at Canyon Island (approximately 10 km downstream). Data was also collected at the former station near Big Bull landing - <i>Taku River near Tulsequah</i> (station 08BB001). The period of record for the station near Tulsequah is 1953-1987 and the data provided is generally for the months of March/April to November/December, but varies from year to year. This information will also be summarized in the supplementary memo.	
13	Fisheries and Oceans (1)	Recommend the proponent identify potential SARA listed species (see Section 3.3).	Section 3.3.1, <i>Fish and Fish Habitat</i> , Vol. 2, notes that there are species present in the Lower Taku River Watershed that have been listed under the BC MOE, as either <i>red</i> (Extirpated, Endangered, or Threatened) or <i>blue</i> (Special Concern). Green Sturgeon (red), Eulachon, Bull Trout and Dolly Varden (all blue listed) are reported on here. Of the blue listed species, only bull trout and Dolly Varden are known to occur on the Canadian side of the Taku River. Green Sturgeon is the only SARA listed species in the Taku River, and has a rating of Special Concern. There are no known spawning grounds for the Green Sturgeon in Canada. Federal documents report bycatch as being rare. Inquiries with DFO regional staff indicate no management plan has been prepared or is in the process of development for the Green Sturgeon.	CEAA screening
14	Fisheries and Oceans (1)	Recommend significance of habitat be noted in document (see Section 3.3)	See Fish Habitat maps attached. Key habitat areas noted are spawning and rearing habitats.	CEAA screening
15	Fisheries and Oceans (1)	Recommend biophysical information for habitats potentially impacted by the proposed barge navigational route and barge landing site be provided. Recommend assessments be conducted in those areas where no information is available (see Section 3.3).	<p>The route between US/Canada border and the barge landing site is shown on Figure 4.2, Vol. 1, and on the Route Atlas, Vol.1, Appendix C. The barge route has been set to avoid, to the extent possible, important rearing and spawning habitats. By operating in the thalweg of the Taku River the barge and tug will have limited, if any, effect on important habitats. Redfern commits to a barging route that will avoid clear water channels. .</p> <p>The potential for barge impacts to juveniles is related to stranding from wave activity on shallow gradient shorelines and at the points along the route where the barge will transition from water to land and vice versa. Along the portion of the route within Canada, the only location where there is likelihood for this to occur is at the barge landing site at Big Bull Slough.</p> <p>Monitoring will be carried out at the landing site to measure the effects on juveniles that may be stranded on shore as the ACB moves from water onto land. Operations will be adjusted to avoid creation of wave action that has the potential to impact juveniles in this area.</p> <p>Winter operations have the potential to affect ice conditions along the route. Commissioning trials with the ACB are expected to begin on the Taku River in late winter 2008. The results of these trials will provide better indication of how best to operate the ACB on ice/snow to minimize the effects on ice conditions (avoidance of open leads, manoeuvring from shelf ice onto river ice etc).</p>	CEAA screening

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16	Fisheries and Oceans (1)	Recommend the proponent conduct consultations with each of the potentially affected river users and provide letters of support and or mitigation to address specific issues raised by those consultations (see Section 3.5).	<p>Commercial fishermen were interviewed on the river in July 2007 to identify concerns related to project. These concerns are summarized in Section 2.1.2, <i>First Nation Issues and Concerns</i>, Vol. 2. Records of these interviews can be provided if requested. Mitigation to address concerns related to disruption of commercial fishery and subsistence fishery is outlined in Table 4-2, page 4-58. A Transportation Communications Plan will be prepared prior to commencement of operations that will include posting and notification of the proposed barge scheduled each season, annual meetings with commercial fishers to monitor effects and adjust operations if/where necessary and possible.</p> <p>Information on commercial wilderness operators was obtained for trip frequency, timing, access and egress. The limited use of the Taku River was discussed in Section 3.5.2, <i>Recreation and Tourism</i>, Vol. 2. Letters of support for development projects are not typically required in an environmental assessment.</p>	CEAA screening BCEA Amendment
17	Fisheries and Oceans (1)	Recommend avoiding a comparison of statements and focus on issue identification and proactive mitigation to address potential impact (e.g. statements referencing river freshets and jokulhlaup flows should speak to potential duration and reversibility of effects and not presented as justification for the effect) (see Section 4.4).	Comparison of effects associated with freshet and jokulhlaup is provided for environmental context (magnitude) and baseline condition of the environment, not justification for effect.	CEAA screening
18	Fisheries and Oceans (1)	Recommend that river morphology profiles are provided at various locations and for various flows of the Taku River and Big Bull Slough, including hydrographs, locations of concern, and flow thresholds (s. 4.4)	This comment does not clearly define the objective of this information. Plan views of the river was provided in detail in Appendix B, <i>Photo Log</i> , and Appendix C, <i>Route Atlas</i> , Vol. 1. A hydrograph from Canyon Island is also provided in Section 3.2.2, <i>Taku River Streamflow</i> , Vol. 2. The Route Atlas provides to scale perspective of barge and river route. As can be seen for the majority of the route, there is plenty of space for the barge and it will be a substantial distance (i.e. 10's of metres) from the shore. A supplemental memo describing the bathymetry of the channel within Canada, and summary of hydrometric data previously recorded near Big Bull Slough is attached. Depth data for Big Bull Slough can be obtained once the ice is off the river.	CEAA screening
19	Fisheries and Oceans (1)	Disruption of sediments can also result from settling due to compaction and or vibration from anthropogenic sources - recommend information be presented to address potential impact (see Section 4.4).	Within Canada this issue would be confined to the barge landing site. Along the rest of the Canadian portion of the route, the ACB transportation system will be travelling in deeper water. Redfern commits to monitoring the substrate conditions adjacent to the barge landing site and take corrective actions if compaction does occur and is attributable to the barge activity. At the barge landing site the water is fairly swift moving and turbid, and according to professional advice a site not well suited for spawning or rearing.	CEAA screening
20	Fisheries and Oceans (1)	Recommend modeling of potential wake generation be presented which utilizes erodibility of potential soils along navigational route, location of lateral and off channel habitats of concern and conditions where Taku River and Big Bull	A review of other larger and faster barge operations suggest that the wake produced and the erosive potential of the wake produced by the ACB transportation system will cause minimal erosion. While specific measurements were not collected during the barging in the summer and fall of 2007, the observed effect of the conventional barge and tug are consistent with the findings presented in Vol. 2. The ACB	CEAA screening

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		Slough thalweg is absent under threshold flow conditions (see Section 4.4).	transportation system is expected to generate less wake than the conventional barge. During commissioning, wake will be measured to confirm assumptions regarding wave heights generated under various speeds, and current velocity. Results of information collected during field trials will be incorporated into operational protocols to minimize shoreline erosion (e.g. speed reduction in sensitive areas).	
21	Fisheries and Oceans (1)	Recommend clarification of barge operating procedures during ice formation and ice break up conditions and how the operating plan is designed to minimize effects of these periods (see Section 4.4).	Ice breaking is not desirable for operations on the Taku River. Operating constraints have been identified and are attached. When shelf ice is less than approximately 3 inches thick, aquatic operations will be maintained in open mainstem channel, and thin ice shelves forming along sides of channel or near gravel bars will be avoided. When shelf ice thickens to greater than approximately 3 inches thick, the route will traverse solid shelf ice and avoid open leads in the mainstem as much as possible to minimize ice breaking and maintain efficient operations. Ice thickness and observations on ice formation and break-up will be measured and monitored during the commissioning (in March 2008) and during the initial years (winters) during operations. Operational procedures will be modified to achieve the best possible outcome (minimal ice breaking) based on these initial test results and operational experience.	CEAA screening BCEA Amendment
22	Fisheries and Oceans (1)	Recommend proponent provide information which identifies the required snow conditions to facilitate normal or current Taku River and Big Bull Slough ice formation while operating the air cushion barge and amphitrac along the proposed routes (see Section 4.4).	In addition to the response above, the initial operating period on snow will include detailed data collection of the ACB/amphitrac effects on snow compaction. The results will be used to develop/adjust winter operating procedures. Snow depth will be recorded at the mine site and /or barge landing site This information, along with temperature and ice thickness, coverage, will be recorded to determine correlations relevant to ice formation and stability at the Big Bull landing site.	CEAA screening BCEA Amendment
23	Fisheries and Oceans (1)	Recommend the proponent provide a large woody debris management plan and identify existing large woody debris prior to operations which are considered within the navigational channel at various hydrologic flows (see Section 4.4).	The general objective for managing large woody debris is to leave it in the channel so that it maintains its functionality as fish habitat. Any large woody debris that poses a threat to navigation will be relocated outside the navigation channel but will remain in the main part of the river providing functional habitat for fish. A more detailed woody debris management plan will be developed in consultation with Fisheries and Oceans Canada during the course of the environmental assessment review and initial aquatic operations.	CEAA screening
24	Fisheries and Oceans (1)	Recommend information on impacts of noise and spray generated from air cushion barge directly upon juvenile salmonids (i.e. quantify noise generated from air cushion barge at source) (see Section 4.4).	Information on underwater noise created by hovercraft is presented in Section 4.4.2.5, <i>Aquatic Noise</i> , Vol. 2. Above surface and underwater noise levels will be measured during commissioning trials of an ACB constructed by Hovertrans in Scotland. These trials are scheduled for mid-January 2008. Additional noise data will be obtained for the ACB that Redfern will take possession of in late Feb/ March 2008. during the commissioning phase. The amount of noise transmitted into the water column is not expected to be significant as engines and lift fans will be enclosed (thus muffling the sound), and the hull hovers above the surface of the water, thus limiting direct transmission of noise into the water column. Noise associated with the amphitrac engines will also be measured during the commissioning phase.	CEAA screening

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			The issue of spray from around the skirt of the air cushion barge was also addressed in the environmental assessment and while the effect on juvenile fish is unlikely to be significant, it will be monitored during the commissioning phase and during operations at several key locations where the ACB moves from water onto land (i.e. the barge landing site).	
25	Fisheries and Oceans (1)	Recommend the proponent provide a fish habitat quantification assessment of existing known fish habitats of the Taku River and the Big Bull Slough (see Section 4.4).	The information cited in the environmental assessment regarding fish habitat and use of that habitat did not attempt to quantify the various types of habitats identified (clear water channels, side channels, etc). The proposed barge route avoids the river edge habitat that fish would typically use for spawning and rearing. Attached is a series of air photos provided in the Route Atlas annotated with known and suspected areas of important fish habitat including rearing and spawning habitat. The attached fish habitat maps shows the key habitat areas along the Taku, based on existing information and observations.	CEAA screening
26	Fisheries and Oceans (1)	Recommend proponent utilize existing landing site located upstream of the proposed location to avoid impacts to Big Bull Slough habitats (see Section 4.4).	The historical landing site referred to by the author is located on the outside bend of Big Bull Slough and is being actively undercut, causing a large cut bank. Utilization of this location would require extensive earthworks and disturbance of the riverbank to create a large, all-season access ramp. The proposed location is on an inside bend of Bull Slough, and is characterized by a broad, gentle gravel bar that provides natural access to the landing area, thereby eliminating the need to alter the riverbank. This location selection reduces environmental disturbance and associated aquatic impacts.	CEAA screening
27	Fisheries and Oceans (1)	Recommend the proponent: (a) clarify how the broad range of potential issues resulting from this land use study will be considered within the review of this proposal and (b) confirm with the First Nations that current and traditional activities being practiced by First Nations in the vicinity of the project have been addressed (see Section 4.7).	The Taku River Tlingit First Nation has been fully engaged in the project and has already identified areas of concern. Discussions have been underway to resolve concerns, and where possible, these mitigation measures have been incorporated into project design, timing, etc. Once the Traditional Land Use Impact Study is completed, any new issues arising from the study will be approached in a similar manner. The manner in which these issues will be addressed will be worked on collaboratively with the Taku River Tlingit First Nation.	CEAA screening
28	Fisheries and Oceans (1)	Recommend storage of diesel fuels are established within Paddy's Flats reducing potential environmental risk to Taku River and Big Bull Slough habitats (see Section 4.8).	Fuel storage on Redfern's privately held land at Big Bull Landing will be limited to that required for re-fuelling of the river equipment. Bulk storage (for mine purposes) at this site is not currently contemplated. Given the need to refuel the river equipment, fuel storage at Paddy's Flats would require a 2 to 3 km long fuel pipeline and would not result in reduction in environmental risk.	CEAA screening
29	Fisheries and Oceans (1)	Recommend storage of concentrate be extremely limited in volume, timing and duration to reduce potential environmental risk to Taku River and Big Bull Slough habitats (see Section 4.8).	Concentrate storage at the marshalling yard at the barge landing area will provide storage capacity for up to 50 containers (approximately one week's production). Containers will be sealed. A Spill Prevention and Response Plan will be implemented to address all aspects of handling, storage and transport of concentrate and other hazardous materials. This Plan will be prepared prior to the start of Operations.	CEAA screening

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30	US Dept of Interior (2)	Request the following information on the barging option and amphitrac and ACB be included: (a) any documents produced examining the barge options; (b) Oct 2006 alternatives transportation route study (author: GLL) that identifies the barge option as preferred over the access road; (c) feasibility assessment examining the hover technology by Hovertrans; (d) vessel suitability report examining other types of vessel technologies; (e) any operational failure effects analyses for amphitrac and ACB.	<ul style="list-style-type: none"> <li>The only known published document that examines previous barge operations on the Taku River is in the Canadian Mining Journal, Volume 7, No. 5 from May 1954.</li> <li>This reference does not clearly define the document the author requests from Redfern. The Feasibility Study prepared for Redfern Resources by Wardrop Engineering in 2007, identified the ACB Transportation System as the preferred site access.</li> <li>The Hovertrans Feasibility Study prepared for Redcorp Ventures Limited is not a publicly available document.</li> <li>No other vessel suitability reports available – the alternative transportation option is the 160km road. Conventional barging is not feasible year-round, as documented in the original EA completed for project</li> <li>(e) Potential operational failures have been addressed in Section 4.8, Volume 2. This section outlines some of the possible mechanical failures, the probability of such failures, and means of addressing them, in the event any should occur.</li> </ul>	BCEA Amendment
31	US Dept of Interior (2)	Insufficient citations to illustrate reliability of data source (e.g. individuals who were contacted, citation for U.S. Postal Service Study (p. 16))	For the US Postal Service study citation, see Volume 2: <i>Volpe National Transportation Centre and Environmental Engineering Solutions. 2000 Hovercraft transportation of Alaska Bypass Mail. Ecological Monitoring Summary Report. Prepared for United States Postal Service.</i>	N/A
32	US Dept of Interior (2)	More information is needed on operating characteristics of the Taku River: - channel geometry; - freeze-up, ice cover, and break-up - variations in the hydrograph - characteristics of terrestrial outwash areas where amphitrac and ACB may travel - winds - natural debris - air temperatures	Information provided in Volumes 1 and 2 is sufficiently detailed to provide a reasonable assessment of the proposed ACB transportation system. As discussed in Section 4.3, <i>River Operations</i> , Vol. 1, and Appendix A, <i>Channel Depth Analysis of the Lower Taku River</i> , Vol. 1, the channel depth analysis of the Taku River is a primary consideration for operations during the shoulder seasons. Taku River hydrology is discussed in Section 3.2, <i>Taku River Hydrology</i> , Vol. 2.  The level of detail requested (e.g. location, height, length of likely ice jams) is not available. The log book kept by the crew will record such things as observations on ice conditions, open leads, navigational challenges. These records will be reviewed seasonally, and operational procedures modified if so indicated. The adaptive management approach will, as with all navigation, respond to changes in river and weather conditions at the time.	BCEA Amendment
33	US Dept of Interior (2)	More information is needed on "barging access" transportation plan and Section 4, <i>Barging Operations</i> , Vol. 1 presents conflicting information on what vessels will be used during what time periods and requires a summary and clarification.	As paraphrased from Volume 1, the expected volumes, number of trips; and materials to be transported is based on expected concentrate production, and expected supply requirements. Details on monthly shipping manifests are not available, but will be generally uniform from month-to-month as detailed in Volume 1.  As detailed in Section 4.3, <i>River Operations</i> , Vol. 1, the marine tugs will be used year-round for the portion of the route between the Taku Inlet and Juneau. Shallow-draught tugs will be used throughout the aquatic season. The amphitrac will assist in shuttling the ACB across the tidal flats during those times of year when there is insufficient depth to allow shallow-draught tugs to traverse the tidal flats. Winter operations, once river is frozen, will require use of amphitrac.	BCEA Amendment

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34	US Dept of Interior (2)	Documentation is needed to substantiate statement that AML dock/ facility in Juneau is capable of handling the trans-shipment without new permits.	Existing facilities operated by AML are outside of scope of this assessment. This would also apply to handling facilities in Skagway. Questions related to the existing handling facilities in Alaska may be addressed in the Alaska review process. AML has repeatedly ascertained that they are capable of handling the transshipment without new permits.	N/A
35	US Dept of Interior (2)	Detailed design information is needed on amphitrac and ACB design (hull materials; skirting materials, etc).	The hull is composed of steel and consists of fifteen watertight compartments. The skirting material is designed to be flexible at temperatures as low as -40°F. Further details on the design specifications will be provided at later date.	N/A
36	US Dept of Interior (2)	Additional information is needed on amphitrac and ACB operations (number crew, manoeuvrability, how debris will be removed, grade requirements).	The manpower required to operate the transportation system is listed in Table 2-2, Volume 1. There are no grade requirements that are relevant for this transportation system – ACB will not be traversing any steep grades along the route. See comment #23 above re: woody debris management in Canada.	N/A
37	US Dept of Interior (2)	Additional information is needed on amphitrac and ACB routes and procedures for determining routes.	Refer to Appendix C, <i>Route Atlas</i> , Vol. 1, which clearly illustrates the size of the ACB and amphitrac in relation to the width of the river along the route. The optimal route taken will depend on the river conditions and season as reconnoitred routinely throughout the season. GPS navigational systems will ensure that operators follow generally prescribed route(s). Any significant variation from a route will be recorded in a daily log and a rationale will be provided for this variance. Log records will be reviewed regularly and the route will be adjusted if needed. ACB will not be traversing fluvial outwash fans, and grooming will only be necessary after heavy snowfall in order to lightly compact snow along the route. A supplementary memo providing additional bathymetric data on the Taku River channel in Canada will be provided.	BCEA Amendment
38	US Dept of Interior (2)	Additional information is needed on amphitrac and ACB mechanisms for environmental effects: - air emissions - noise - size of wake - size and pressure of "footprint" - amount, depth, and extent of increased water pressure	<ul style="list-style-type: none"> <li>Noise is discussed in Section 3.1.1.2, <i>Noise</i>, Vol. 1, and underwater noise effects are discussed in Section 4.4.2.5, <i>Aquatic Noise</i>, Vol. 2. Commissioning trials will provide additional data on above surface and underwater noise associated with the ACB and amphitrac.</li> <li>Wake is discussed in Section 3.1.1.3, <i>Wake</i>, Vol. 1, and effects of wake are discussed in Section 4.4.2.1, <i>Re-suspension of Sediments and Bank Erosion</i>, Vol. 2. Commissioning trials will provide data on wave heights measured at various speeds in deep water.</li> <li>Amphitrac rubber tires will be similar to those used on Rolligon vehicles; pressure is indicated between 2-5 psi, typically set at 3 psi</li> <li>Displacement of water will occur as with any other floating object. Water is incompressible. Amount of displacement would be approximately 1240 m3 when barge is fully loaded.</li> </ul>	BCEA Amendment
39	US Dept of Interior (2)	Additional information is needed on amphitrac and ACB operational limitations.	Operational procedures have been developed based on current understanding and knowledge of the operating capabilities of the equipment, and the range of river conditions that are typically encountered on the Taku River throughout the year. These operating procedures will be monitored during the	BCEA Amendment



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			commissioning and initial operating phases, and adjustments to operating procedures will be made where indicated. These procedures are attached, and include certain operating constraints due to extreme weather conditions.	
40	US Dept of Interior (2)	Additional information is needed on amphitrac and ACB incident prevention, contingency planning, and response	Scenarios describing potential accidents and malfunctions are described in Section 4.8, <i>Accidents and Malfunctions</i> , Vol. 2. A Spill Prevention and Response Plan will be developed prior to operations.	CEAA screening
41	US Dept of Interior (2)	Additional information is needed on amphitrac and ACB existing and historical use in Canada, the U.S.A. and elsewhere	The amphitrac is based on a low-ground pressure vehicle such as a Rolligon, Foremost or Catco Tractor. These vehicles are used extensively across Canada and Alaska's North. Likewise, Air Cushion Vehicles (hovercraft) are used across the North, including successful active, year round service on the Kuskowim River and at King Cove in Alaska. An air cushion barge designed and built by Hovertrans was operated year-round on the Yukon River during the construction of the TransAlaska pipeline. This is well documented on Hovertrans corporate website.	N/A
42	US Dept of Interior (2)	Additional information is needed on amphitrac and ACB equipment, including the grapple mounted on the hydraulic arm and the Rolligon-type wheel	A standard hydraulic arm will be mounted on the amphitrac to provide route maintenance, if required. The hydraulic arm can be fitted with a grapple for log handling in Canada during the open water season, or a flail for compacting jumble ice during the winter. The ACB will be fitted with a retractable keel-wheel in the centre of the hull. The wheel will be a low-ground pressure wheel identical to that used on the amphitrac and can be hydraulically lowered to reduce side-slippage when traversing low gradient side-slopes.	BCEA Amendment
43	US Dept of Interior (2)	Additional information is needed on the rationale for pulling (or winching) the ACB across sandbars on the east side of Canyon Island (Volume 1, page 34).	The Alaska permitting process will address navigation around Canyon Island.	N/A
44	US Dept of Interior (2)	It is unclear if all stakeholder interests of the Douglas Indian Association are included in the documentation, and if not included, additional information needs to be included.	Redfern has communicated with the Douglas Indian Association on several occasions to discuss their specific interests in this project. They have submitted a letter with concerns to the BCEAO. We are not aware of concerns in addition to those already submitted. The company is in regular contact with the staff of the Douglas Indian Association and will continue to solicit input from the Douglas Indian Association as the project develops.	N/A
45	US Dept of Interior (2)	Additional information is needed to understand vessel disturbance of bottom materials will result in greater disturbance than freshet and jokulhlaup.	Freshet and outburst floods are of much larger magnitude, lasting for several days (jokulhlaup) to several weeks (freshet), each year. Figure 5-5, <i>Low and High Water in Taku River</i> , on page 5 -16, Vol. 2, illustrates the scale of the freshet that occurred in June 2007 just upstream of Cranberry Island.	BCEA Amendment

## Issues Tracking Table - Tulsequah Chief Barge Transportation System – Project Certificate Amendment Application

ISSUE NUMBER	AUTHOR OF COMMENT	ISSUE RAISED BY GOVERNMENT	REDFERN RESPONSE	APPLICABLE REGULATORY PROCESS
			Vessel disturbance of substrates is discussed in Section 4.4.2.1, <i>Re-suspension of Sediments and Bank Erosion</i> , Vol. 2. Due to minimal wake and use of thalweg during aquatic operations, disturbance of substrates in river channel is expected to be minimal.	
46	US Dept of Interior (2)	Requires identification of shoreline areas potentially sensitive to erosion that will be monitored as part of mitigation procedures.	The barge landing area at Big Bull Slough will be managed and monitored to prevent erosion. There are no other locations within the Canadian portion of the Taku River that have been identified as potentially sensitive to erosion caused by the ACB. Concerns within the Alaskan portion of the river will be addressed in the State review process, and are not within the scope of this assessment. The Alaska process will allow for these areas to be identified prior to commencement of aquatic operations. One of the areas will likely include Martini Row.	BCEA Amendment CEAA screening
47	US Dept of Interior (2)	Additional information is needed on consultation with Federal and State agencies.	This request is not within the scope of this assessment. The Alaska process will include an opportunity for an agency and public comment period.	N/A
48	US Dept of Interior (2)	Additional details on how monitoring of effects of transportation system on salmonids will be accomplished, including stranding, and how a determination will be made as to whether the numbers of fish strandings are "significant".	Monitoring will include identification of low gradient beach areas in Canada where wave wash could push juveniles up on to shore. In Canada, the barge landing site is the only area where the ACB will routinely transition from water to land. Systematic surveys of components such as wave height, distance the wave pushes water up the beach and surveys for fish stranded will be carried out. Any record of fish being stranded (not expected given slow speed of ACB) will be reported to Fisheries and Oceans Canada. If needed, an assessment of the proportion of juveniles stranded relative to the estimated total population of juveniles would be used. We suggest that the determination of significance would be if annual mortality due to stranding at the barge landing site exceeds 1% of the estimated total population of fry for any one species.	BCEA Amendment CEAA screening
49	US Dept of Interior (2)	Need to address potential effects of displacing sediment and gravel in shallow areas of the river as indirect effects from (a) relocating woody debris from river to channel sides and (b) movement of amphitrac over gravel.	The navigational hazards posed by snags in the river occur predominately on the Canadian side, and are not a major concern in the lower Taku River. See response to Issue #23 regarding procedures re: woody debris. During the conventional barging in 2007 there was the necessity to move approximately 5 snags very near the future barge landing facility. Other than that no other snags were moved. The snags were shifted in the channel, and remained an active habitat element in the Big Bull Slough.	CEAA screening
50	US Dept of Interior (2)	Additional information is needed on eulachon egg disturbance.	Eulachon spawning occurs in the lower Taku River, not within Canada. Information presented in Volume 2 indicates that eulachon spawning will take place in early to mid May. By this time the water levels in the Taku River are typically rising above 500 m <sup>3</sup> /s providing sufficient depth for the ACB transportation system to travel through the eulachon spawning area without disturbing the eggs on the bottom. The initial aquatic trials in 2008 will include observation of barging on the tidal flats and selecting a route that provides the	N/A

## Issues Tracking Table - Tulsequah Chief Barge Transportation System – Project Certificate Amendment Application

ISSUE NUMBER	AUTHOR OF COMMENT	ISSUE RAISED BY GOVERNMENT	REDFERN RESPONSE	APPLICABLE REGULATORY PROCESS
			least disturbance to the substrate and (potentially) eggs. The plan would be to select a route that can be used for multiple trips to limit the spatial extent of potential disturbance to eulachon eggs over the tidal flats.	
51	BC Ministry of Environment (3)	Information provided does not adequately address project impacts so that the ministry decision makers would be able to make an informed decision on the project.	The detailed assessment on the potential effects of the ACB transportation system will be provided in <i>Tulsequah Chief Mine ACB Transportation System - Detailed Wildlife Effects Assessments and Mitigation Measures</i> available by mid-January 2008 and will provide sufficient information to allow government decision makers to make an informed decision on the project.	BCEA Amendment
52	BC Ministry of Environment (3)	While some wildlife information has been collected to evaluate the ACB option, not all of this information has been provided for review, particularly in relation to the haul road	A detailed assessment on the potential effects of the ACB transportation system including the proposed haul road to the ACB landing site is provided in <i>Tulsequah Chief Mine ACB Transportation System - Detailed Wildlife Effects Assessments and Mitigation Measures</i> available mid-January 2008.	BCEA Amendment
53	BC Ministry of Environment (3)	Recommend submitting TEM maps for haul road.	Terrestrial Ecosystem Mapping for the haul road will be completed and made available to reviewers by mid-January 2008.	BCEA Amendment
54	BC Ministry of Environment (3)	How do reviewers know there are no significant residual effects predicted for terrestrial mammal species with a semi-quantitative assessment, when the MOE will be identifying possible impacts and mitigation based on science?	A detailed assessment on the potential effects of the ACB transportation system is provided in <i>Tulsequah Chief Mine ACB Transportation System - Detailed Wildlife Effects Assessments and Mitigation Measures</i> available by mid-January 2008. This detailed assessment provides quantitative information on the potential effects on wildlife habitats using the available 1:50,000 and 1:10,000 scale TEM mapping and 1:50,000 habitat suitability mapping.	BCEA Amendment
55	BC Ministry of Environment (3)	Recommend development of monitoring plans at this time (i.e. during the EA process) and a wildlife assessment would provide sufficient detail to create these plans.	The proposed monitoring and mitigation measures to reduce those effects is provided in <i>Tulsequah Chief Mine ACB Transportation System - Detailed Wildlife Effects Assessments and Mitigation Measures</i> available by mid-January 2008. This report proposes monitoring options with the intent that detailed monitoring plans will be developed in conjunction with the Ministry of Environment and Taku River Tlingit First Nation early in 2008.	BCEA Amendment
56	BC Ministry of Environment (3)	Appendix A should include all of the environmental management required for the project with the details of how this will be undertaken. Currently missing at least the following plans: Fish and wildlife management, bear/human management, snow and avalanche management, Bald Eagle Nest Compensation & Monitoring. Recommend providing the Wildlife Management Plan and the Bear/Human	Appendix A, <i>Environmental Management Program Outline</i> , Vol. 2, provides the outlines for a management plan. It is intended that additional issues and commitments received during the review process will help inform the development of a more detailed Environmental Management Plan. We anticipate that the EA Certificate would require a complete environmental management program, which would need to be in place prior to the commencement of the barging operations. . An annotated Table of Contents for the Wildlife Management Plan will be available for review by mid-January 2008 with sections on best management practices and policies for construction and operations available by late January 2008 for review. Detailed	BCEA Amendment

## Issues Tracking Table - Tulsequah Chief Barge Transportation System – Project Certificate Amendment Application

ISSUE NUMBER	AUTHOR OF COMMENT	ISSUE RAISED BY GOVERNMENT	REDFERN RESPONSE	APPLICABLE REGULATORY PROCESS
		Management Plan for assessment of the best management practices and monitoring programs (Volume 2, p. 4-28).	monitoring plans and strategies would be developed in conjunction with resource agencies and the TRTFN starting in late January 2008.	
57	Environment Canada (4)	Environment Canada will send comments in a subsequent letter as soon as possible: -wetlands -species at risk -migratory birds	Once comments on these topics have been received, a response will be prepared to address them. See Issues # 68 – 71.	BCEA Amendment CEAA screening
58	Environment Canada (4)	Requests information on inspection process that will be in place to ensure that the environment is protected against the release of hazardous substances into the water, from the point of loading to after unloading at the designated site	Details of inspection process will be provided in Spill Prevention and Contingency Plan. This plan will be available for review prior to commencement of routine operations. The Plan will include a Prevention Section with checklists. Regulations under <i>Canada Shipping Act</i> (2001) not yet released. These are expected in March 2008. This plan will also address fuel stations and fuel dispensing, in addition to unloading and loading at the barge landing site.	CEAA screening BCEA Amendment
59	Environment Canada (4)	Requests proponent review their spill contingency plan to ensure that it meets the <i>Guidelines for Industry Emergency Response Contingency Plans</i> .	Spill Prevention and Contingency Plan will follow recommended guidelines where applicable. We suggest the following planning requirements for Oil Handling Facilities (OHFs) regarding the <i>Canada Shipping Act</i> (2001) to be reviewed by Transport Canada. We will consider these guidelines suggested by Environment Canada, but the CSA considers all of those measures included in these guidelines and goes beyond these measures.	CEAA screening BCEA Amendment
60	Environment Canada (4)	Unclear if Southeastern Alaska Petroleum Resource Organization (SEAPRO) would be able to respond to a spill in Canadian waters and, if not, it is unclear if a similar arrangement could be made with a similar Canadian response organization.	Given remote nature of site, existing Canadian response agencies would not likely be able to provide meaningful assistance. However these arrangements will be investigated as part of developing the Spill Prevention and Contingency Plan. Redfern may be asked by CSA to join the Burrard Clean Operations (BCO). BCO operates through local contractors. Redfern will investigate this opportunity. In any case, local contractors who can contribute to a spill response will be contacted.	CEAA screening BCEA Amendment
61	Environment Canada (4)	Requests the following steps to be in place and / or commitments documented: -all tanks should have in place automatic shut off valves, be placed in locations where they will not be “impacted” by equipment or have impact resistant barriers installed around the tanks/tank trucks, etc., and the fuel storage sties should have containment areas -page 4-46 of Volume 2 states that fuel tanker trucks “will be secured on the ACB by industry standard methods” - what the industry-standard methods?	These recommendations will be taken into consideration during the development of the Spill Prevention and Contingency Plan as well as the detailed design of facilities. Specific operating procedures will be developed as part of the pill Prevention and Contingency Plan. Fuel facilities will comply with requirements of the BC Fire Code and best practices. Transportation of Dangerous Goods can advise Redfern on the appropriate means of securing trucks. Response equipment will be selected and located in a manner that is appropriate for spill scenarios identified in the plan. The OHF Plan will include a section on training that indicates the programs that will be in place to ensure personnel are trained and knowledgeable in spill prevention and response.	CEAA screening BCEA Amendment

Issues Tracking Table - Tulsequah Chief Barge Transportation System – Project Certificate Amendment Application

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		<p>-response equipment capable of handling different substances which are being transported need to be located in appropriate locations so that access to operating equipment is readily available in the event of a spill</p> <p>-what commitments has Redfern made regarding the training of its personnel in fuel handling and/or transferring procedures, spill response etc? This commitment should be documented in the Spill Contingency Plan.</p>		
62	Environment Canada (4)	Fuel Storage: recommend all storage and handling of petroleum products and allied petroleum products be in accordance with CCME <i>Environmental Code of Practice for Storage Tanks Systems Containing Petroleum Products and Allied Petroleum Products</i> , including so-called “temporary” fuelling facilities.	The Spill Prevention and Contingency Plan will follow recommended guidelines where applicable. The BC Fire Code will be followed as well as best practices. The CCME Code will also be complied with. It is not nearly as detailed as the Fire Code.	CEAA screening BCEA Amendment
63	Environment Canada (4)	Fuel Storage: all work pertaining to the design of any permanent aboveground storage tank system greater than 4,000 L or any underground storage tank system should be stamped by a qualified Professional Engineer	All permanent fuel storage facilities will be designed and constructed with the applicable regulatory requirements for professional design. Underground oil storage systems will not be utilized.	CEAA screening BCEA Amendment
64	Environment Canada (4)	Fuel Storage: recommend that a written spill response plan should be available at any petroleum product storage facility. For larger facilities, an emergency response plan in accordance with the BC Environmental Guidelines for Industry Emergency Response Contingency Plans is recommended.	Copies of the Spill Prevention and Contingency Plan will be available at fuel storage facilities. Spill Prevention and Contingency Plan will follow recommended guidelines where applicable. Planning requirements for an OHF Plan will be met as specified under the <i>Canada Shipping Act (2001)</i> . BC and other federal regulations and guidelines will also be followed.	CEAA screening BCEA Amendment
65	Environment Canada (4)	Fuel Storage: recommended that materials of spill clean-up equipment be kept on site to deal with any accidental spillage or leaks.	Spill cleanup equipment will be kept on site and on the river equipment. Specific of type of equipment, supplies and locations will be detailed in the Spill Prevention and Contingency Plan. The Fire Code requires a spill cleanup capability for 1,000 litres of flammable product wherever these are dispensed. The <i>Canada Shipping Act (2001)</i> also has spill cleanup requirements. All regulatory requirements will be met.	CEAA screening BCEA Amendment

## Issues Tracking Table - Tulsequah Chief Barge Transportation System – Project Certificate Amendment Application

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66	Environment Canada (4)	Recommend proponent review the enclosed <i>Implementation Guidelines for Part 8 of the Canadian Environmental Protection Act, 1999 – Environmental Emergency Plans</i> to determine if the <i>Canadian Environmental Protection Act, 1999</i> (CEPA 1999) Environmental Emergency Regulations (E2) apply (if E2 Regulations apply, the proponent is required to submit Notice(s) to Environment Canada as soon as possible)	Applicability of the provided guidelines is currently being reviewed, and will be incorporated into the Spill Prevention and Contingency Plan as appropriate. Environmental Emergency Regulations (E2) relates to certain chemicals stored in specific amounts. Diesel is not included. An E2 plan for other chemicals will be written, if required for these chemicals. Gasoline is specified as an E2 chemical but may be adequately addressed in the OHF Plan.	CEAA screening BCEA Amendment
67	Environment Canada (4)	Air Quality: quantitative information regarding potential air emissions for this project is needed to enable assessment for adverse environmental effects: - characterize existing air quality - estimate emissions - describe aspects of the project that will avoid or reduce air emissions - estimate avoided emissions from truck traffic on road to Atlin and beyond, attributable to the use of the ACB system	Air quality data for the Tulsequah River area is limited, but detailed in the Project Description Report (Rescan 1997). Emission reductions, relative to the Atlin road (previously assessed) are calculated as follows: <ul style="list-style-type: none"> <li>The Atlin road option required 15-million vehicle km per year by standard highway transport truck. Based on a typical B-train fuel consumption of 1.7 km/L (Transport Canada 2003 – Truck Activity in Canada – A Profile) and a CO<sub>2</sub> emission rate of 2.73 kg/L, a total of 24,000 tonnes of CO<sub>2</sub> would be emitted annually by the Atlin Road option.</li> <li>- Assuming one-round trip of the ACB system consumes 17,000 L of fuel per round trip (ACB plus tow equipment), and a total of 330 trips per year, this results in an annual CO<sub>2</sub> emission of approximately 15,000 tonnes. This is a 37% reduction in transportation related emissions.</li> </ul>	CEAA screening BCEA Amendment
68	Canadian Wildlife Service (CWS), Environment Canada (5)	In the event the proponent determines that its activities will unavoidably overlap with the breeding bird season (CWS advises that the general migratory bird breeding season for the area in which the project is located is May 1 <sup>st</sup> to July 31 <sup>st</sup> ), CWS expects due diligence be exercised to avoid harm to migratory birds, and recommends that the proponent employ an Active Migratory Bird Nest Survey (AMBSN) program to reduce the likelihood of disturbing or destroying active nests. Doing so reduces the likelihood that the proponent will be in contravention of the <i>Migratory Birds Convention Act</i> (MBCA). CWS can provide advice to the proponent in the development of an AMBSN if the proponent makes that request.	Redfern is committed to reduce the likelihood of disturbing or destroying active nests. Appendix A, <i>Environmental Management Plan Outline</i> , Vol. 2 provides a basic outline of the measures that will be developed to minimize project effects. As described on page A-2, the Wildlife Management Plan will incorporate bald eagle nest monitoring and monitoring of foraging behaviour related to ACB movements for waterfowl and shorebirds. Redfern will employ an Active Migratory Bird Nest Survey immediately before and during, any construction or operations that may affect nesting birds during the general breeding bird season. Additional information on this breeding survey will be made available to the CWS prior to the beginning of construction and operation activities related to this amendment.	BCEA Amendment
69	Canadian Wildlife Service (CWS), Environment Canada (5)	Based on information provided in the report, Gartner Lee Limited (GLL) conducted aerial bird surveys in March and May of 2007. As indicated, Trumpeter swans and other waterfowl species were observed, and in abundance, within wetlands and other habitats associated with the Taku River. The report recommends developing a Wildlife Management	Appendix A, <i>Environmental Management Plan Outline</i> , Vol. 2 provides a basic outline of the measures that will be developed to minimize project effects. As described on page A-2, the Wildlife Management Plan will incorporate bald eagle nest monitoring and monitoring of foraging behaviour related to ACB movements for waterfowl and shorebirds. This Plan will be made available for agency review and comment prior to the beginning of construction and operations related to this amendment.	BCEA Amendment

Issues Tracking Table - Tulsequah Chief Barge Transportation System – Project Certificate Amendment Application

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		Plan to monitor bird presence and abundance along the air cushion barge route. CWS recommends that any such plan incorporate migratory birds and species at risk, and be developed for agency review and comment during the environmental assessment.		
70	Canadian Wildlife Service (CWS), Environment Canada (5)	CWS notes that, additionally, the BC Ministry of the Environment has requested additional information relating to wildlife. CWS is also interested in reviewing and reassessing any additional information, in particular as this information might relate to migratory birds and/or species at risk.	A detailed assessment on the potential effects of the ACB transportation system on wildlife including the proposed haul road to the ACB landing site is provided in <i>Tulsequah Chief Mine ACB Transportation System - Detailed Wildlife Effects Assessments and Mitigation Measures</i> available mid-January 2008.	BCEA Amendment
71	Canadian Wildlife Service (CWS), Environment Canada (5)	Wetlands have important ecological roles, including for migratory birds and Species at Risk. A primary objective of the <i>Federal Policy on Wetland Conservation</i> , 1991 is to maintain wetland integrity and functionality. This objective supports Environment Canada's mandate to sustain bird species and populations, in their habitats and across their ranges. Based on the information provided to date, it is unclear that the proponent has fully assessed or characterized any likely impacts upon wetland habitats downstream of the proposed impoundment area. Based on the above, CWS recommends that information be collected to assess: (1) Potential project impacts upon wetland habitats; (2) Potential impacts to migratory birds and Species at Risk as a result of (1) above; and, (3) Mitigation and/or compensation measures as and where appropriate to address (1) and/or (2) above.	Section 3.4.3 <i>Terrestrial Ecosystems</i> , Vol. 2, describes the wetland complexes identified in the project area and Figure 3-9 shows an example of a wetland found in the Lower Taku River at Johnson Creek. (1) Section 4.5.3 <i>Ecosystems Assessment</i> , Vol. 2, describes the potential project impacts on wetland habitats. The evaluation concludes that there are no predicted residual effects on wetlands resulting from the construction and operation activities of the ACB Transportation System. The evaluation found a Very Low potential effect due to changes in downstream water quality and quantity may result in changes in wetland soil moisture and/or nutrient regimes. Redfern has committed to developing and implementing an Erosion Control Plan and a Riparian Management Plan so no residual effects are expected. (2) Since no residual effects on wetlands are expected, there are no indirect effects to migratory birds or Species at Risk as a result of wetland impacts and (3) no need for additional mitigation or compensation measures.	BCEA Amendment

Respondents:

1. Dale Desrochers, Habitat Biologist, EA & Major Project Unit, Fisheries and Oceans, Pacific Region. October 5, 2007. Re: Tulsequah Chief Mine Project – Air Cushion Barge Transportation System, Volume 1 & 2.
2. Pamela Bergmann, Regional Environmental Officer – Alaska, United States Department of the Interior. October 5, 2007.
3. Karen A Diemert, Section Head, Ecosystems Environmental Stewardship Division, British Columbia Ministry of Environment, Skeena Region. October 31, 2007. Comments for the Tulsequah Chief Mine Air Cushion Barge Transportation System Supporting Information for the BC Environmental Assessment Certificate, August 2007.
4. Stephen Sheehan, Senior Environmental Assessment Scientist, Environmental Protection Operations, Environmental Stewardship Branch, Environment Canada. December 4, 2007. Tulsequah Chief Mine Project – Documents for the Air Cushion Barge Transportation Option.
5. Stephen Sheehan, Senior Environmental Assessment Scientist, Environmental Protection Operations, Environmental Stewardship Branch, Environment Canada. December 14, 2007. Tulsequah Chief Mine Project – for the Air Cushion Barge Transportation Option Environment Canada Additional Comments. (Comments in Environment Canada letter are authored by Canadian Wildlife Service.)

Comments attached.